

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
9 October 2003 (09.10.2003)

PCT

(10) International Publication Number
WO 03/083033 A2

(51) International Patent Classification⁷: **CI1D 9/44,**
9/26, A61K 7/50

(21) International Application Number: PCT/US03/06755

(22) International Filing Date: 5 March 2003 (05.03.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/107,383 27 March 2002 (27.03.2002) US

(71) Applicant: **KIMBERLY-CLARK WORLDWIDE, INC.** [US/US]; 401 N. Lake Steet, Neenah, WI 54956 (US).

(72) Inventors: **MACDONALD, John, Gavin**; 1472 Knollwood Terrace, Decatur, GA 30033-1907 (US). **AGARWAL, Naveen**; 2792 Peeler Road, Atlanta, GA 30360 (US). **HUANG, Yanbin**; 507 Belcourt Parkway, Roswell, GA 30076 (US). **KIM, Jaeho**; 480 Elgaen Court, Roswell, GA 30075 (US).

(74) Agents: **ROBINSON, James, B.** et al.; Kimberly-Clark Worldwide, Inc., 401 N. Lake Street, Neenah, WI 54956 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SI, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



WO 03/083033 A2

(54) Title: USE INDICATING SOAP

(57) Abstract: There is provided a soap that contains an indicator that produces an observable change after a period of time to show that sufficient cleaning has been done or to indicate the thoroughness of the cleaning. The soap is preferably made from two components that produce a color and/or viscosity changes after about 30 seconds of use. This use indicating change is useful for, for example, teaching children to wash their hands for a sufficient period of time.

USE INDICATING SOAP

BACKGROUND OF THE INVENTION

The present invention concerns soap for hand, body and surface washing.

Soap and water are effective cleaners and, depending on ingredients, can be effective in fighting bacteria and other causes of illness. In many cases, effective cleaning and disease control occur only after certain periods of time or at elevated temperatures.

5 While it may be a relatively simple matter for adults to judge the appropriate time for washing, this is not always the case with children. Children, whether in brushing teeth or washing hands, for example, tend to spend less time on the task than desired by parents and other caregivers. This can result in ineffective cleaning.

It is, therefore, quite important for children to learn the correct way of completing a
10 key hygiene task such as brushing teeth or washing hands. In order for these habits to form at an early age, parents or guardians typically rely on constant reminders and close monitoring. It takes a lot of time and attention from the parent or the guardian in their attempts to build and reinforce these hygiene habits. Further, children tend to follow the instructions only as long as they feel they are being monitored. Most often, children grow
15 up learning these habits only as a result of pressure from their parents or guardians, and do not maintain these habits once the pressure of close monitoring is absent.

An important aspect of building these hygiene habits is to involve the children in completing the task in a way that focuses their attention on the hygiene activity in a non-threatening and natural manner. One way of accomplishing this would be to introduce an
20 element of fun and play so that children enjoy completing the task while building these habits. Another way would be give them a sense of accomplishment by providing a feedback signal they can easily understand and associate with correctly completing the task. If there is an element of fun and play in addition to a clear feedback indication,

children are likely to complete the hygiene task without any need for close supervision and monitoring by their parents and guardians.

Various approaches have been used to remedy this problem. In the case of tooth brushing, flavored toothpastes have been developed to encourage children to brush
5 longer, because they like the taste. This approach is not available for soap, however. A clock or timer can also be used but has drawbacks as well.

There remains a need, therefore, for a soap product that may be used by a consumer and which will give an indication of when sufficient use has occurred. It is an object of this invention to provide such a use indicating soap.

10

SUMMARY OF THE INVENTION

In response to the discussed difficulties and problems encountered in the prior art, a new cleaning aid has been developed wherein the aid contains an indicator that
15 provides a change detectible by a user after a period of time after dispensing has passed. The cleaning aid may be, for example, a soap, and the change may be in color, in viscosity, in smell, temperature or even in sound. The observable change may occur in from a finite time to at most 5 minutes or more particularly about 45 seconds, or still more particularly between 15 and 35 seconds.

20 If the cleaning aid is a soap, the soap is preferably made from a first component including liquid soap and a dye, and a second component including ascorbic acid and iron chloride. The components are mixed together to produce the soap. The soap may change color from green to blue.

The soap may alternatively have liquid soap and polyvinyl alcohol, and optionally, a second component including borax and citric acid. Alternatively, the soap may be liquid soap and a second component, which is an ion sensitive polymeric material. In yet another alternative, the first component may be liquid soap and a polyoxyalkylene block
5 co-polymer, and the second component may include polyacrylic acid. In yet another alternative, the soap may have a first component including liquid soap and a cationic cellulosic quaternary ammonium derivative, and a second component including polyacrylic acid. The components are mixed together to produce the soap.

The soap changes viscosity from a gel to a liquid. The soap changes viscosity in
10 from a finite time to at most 45 seconds after the components are mixed together. More particularly, the soap changes viscosity between 15 and 35 seconds after the components are mixed together.

The soap may alternatively have a first component including liquid soap, a dye and polyvinyl alcohol, and a second component including borax, citric acid, ascorbic acid and
15 iron chloride. The components are mixed together to produce the soap. The soap changes viscosity from a gel to a liquid and simultaneously changes color from green to blue. The soap changes viscosity and color in from a finite time to at most 45 seconds after the components are mixed together. More particularly, the soap changes viscosity and color between 15 and 35 seconds after the components are mixed together.

20 This invention also encompasses a hygiene teaching aid and a method of developing a hygiene habit. The hygiene teaching aid has an indicator that provides a change detectible to a user after a period of time after dispensing has passed. The method of developing a hygiene habit includes the steps of dispensing soap and water into a user's hands, rubbing the hands together until a change detectible to the user is
25 detected, and washing the hands with water, where the soap contains an indicator that provides the change after a period of time after dispensing the soap into the hands has passed.

DETAILED DESCRIPTION OF THE INVENTION

It has long been a concern to parents that their children wash for a sufficiently long
5 period of time to remove dirt and/or kill any illness causing organisms on their skin. Since
children tend to hurry through this task, however, parents are often frustrated in their
success in this area. The inventors believe that a soap that indicates when a presumably
sufficient time of washing has passed will aid parents and other caregivers in the task of
teaching children proper washing techniques. The inventors believe that children will find
10 their soap to be fun and playful and will enjoy using it, thus building and reinforcing proper
hygiene habits.

Another aspect of cleaning, more problematic with surface cleaning than in
handwashing, is to avoid missing areas entirely. In cleaning a kitchen or bathroom
counter, for example, areas may be missed, and there may be no indication that the area
15 has not been washed. An indicator that told the user that all areas he desired to be
washed were indeed washed would be important in many areas, such as the cleaning of
medical and dental tools, infant bottles and pacifiers, utensils and many more. In this
respect, the soap of this invention may be thought of as a cleaning "thoroughness"
indicator.

20 The amount of time needed to clean the skin or a surface has been researched
extensively. The Center for Disease Control (CDC), a division of the US Department of
Health and Human Service, Public Health Service, has developed guidelines for such
cleaning. The CDC Guideline for Handwashing and Hospital Environmental Control, 1985
notes at page 7 that "the ideal duration of handwashing is not known, but washing times
25 of 15 seconds or less have been reported as effective in removing most transient
contaminants from the skin". The CDC Guidelines at page 9 recommend "for routine
handwashing, a vigorous rubbing together of all surfaces of lathered hands for at least 10

seconds, followed by thorough rinsing under a stream of water". The Association for Professionals in Infection Control and Epidemiology (APIC) Guideline for Hand Washing and Hand Antisepsis in Health-Care Settings (1995) also recommends a wash time of 10 – 15 seconds at table 1 for routine hand washing. Antimicrobial soap or detergent or
5 alcohol-based handrub is recommended to remove or destroy transient microorganisms, while soap or detergent are recommended to remove soil and transient microorganisms.

The APIC Guideline also notes (page 7) that traditional surgical hand scrubbing is performed in the United States and Europe for 5 minutes. The instant invention may be formulated in such a way as to indicate when larger periods of time have passed by the
10 appropriate choice of ingredients.

In its broadest embodiment, the invention includes soap and an indicator that provides an observable change after a period of time. It preferably contains at least one dye or pre-dye and a modifying agent that causes a change to occur. These components may be kept separate until washing is begun, or may be mixed in a manner such that the
15 change does not occur until washing. Thus the components may be kept in a two part dispenser or may be kept together with one component inactive by some means, such as by microencapsulation, until sufficient physical stimulus results in their effective mixing. The components may also be kept separate by being a simple non-miscible mixture of two phases.

20 The soap of this invention may be made to indicate that a presumably sufficient time has passed by any mechanism that may be observed by a user; color, smell, sound, temperature, and viscosity change and a combination thereof. These indicators may be activated through changes in pH, oxidation and reduction, metal complexing and gelation. These indicators may also be used to ensure that all areas one desires to have cleaned,
25 whether on the hands, another body part, or another surface, have indeed been cleaned.

Changes in color may be from colorless to colored, colored to colorless, or from one color to another. The viscosity change may be from liquid to gel, liquid to paste, liquid

to solid, and any permutation thereof. A sound may be generated or terminated at the appropriate time or a smell may be generated, for example, for users unable to see color change.

The following embodiments illustrate the invention in varying scope.

5 An indicating soap was made starting with standard colorless, over-the-counter liquid soap, Kimberly-Clark Professional antibacterial Clear Skin Cleanser (PCSC C2001-1824). A small amount of food grade dye, in this case 0.2 weight percent of FD&C (food, drug & cosmetic) green dye number 3 from BF Goodrich of Cincinnati, Ohio, was added to the liquid soap. Mixed separately were antibacterial soap and a decolorizing agent. The
10 decolorizing agent was 1 weight percent ascorbic acid from Aldrich Chemical Company of Milwaukee, Wisconsin and 1 weight percent iron chloride also from Aldrich Chem. Co. When the two components are mixed in approximately equal proportions in the hand, for example, the color will initially be green. After about 30 seconds the color will gradually change to blue. The speed of the color change is controlled by the concentration of the
15 decolorizing agent. The residual blue color is useful in indicating how thoroughly the hands have been rinsed after use.

 The viscosity changes of polymer solutions can be induced by many factors. One of them with viscosity increasing can be achieved by chemically or physically increasing the apparent molecular weight of polymers. The chemical methods include crosslinking
20 reactions such as poly(vinyl alcohol) solution mixed with borax, while the physical methods include forming inter-polymer complexes such as hydrogen-bonding, hydrophobic, and polyelectrolyte complexes. On the other hand, solutions of some special chemicals are dilatant or rheopexy fluids. Their viscosity changes with shear rate or time, and hence can also be incorporated into liquid soaps to induce viscosity changes.

25 In a viscosity changing embodiment of the invention, the same colorless liquid soap (PCSC C2001-1824) was used. FD&C green dye number 3 in an amount of 0.2 weight percent and 5 weight percent of polyvinyl alcohol from Aldrich Chemical, having an

average molecular weight of 85,000 to 146,000 and 87 to 89 percent hydrolyzed, was added to the soap to make a first component. In this case, a mixture of 0.2 weight percent sodium tetraborate decahydrate (Aldrich Chem.) and 2 weight percent citric acid in liquid soap was the second component. When the two components were mixed, a gel was formed in the hand. After some time, dependent in this case upon the concentration of the citric acid, the gel is broken down and the soap has a water-like consistency.

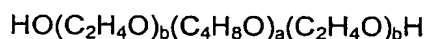
In another viscosity changing embodiment of the invention, about same amount of an ion sensitive water-soluble polymer and liquid soap (PCSC C2001-1824) are applied from a two-chamber dispenser onto the hands. The system viscosity dramatically increased and became very sticky in the hand washing process. The mixture is also easy to rinse off the hand with water. The ion sensitive polymeric materials are described in US Patent 6,194,517 to Pomplun et al., commonly assigned, which issued February 27, 2001 and in allowed US Patent Application 09/223,999, filed December 31, 1998. The patent teaches water soluble polymers comprising from about 25 to about 90 weight percent of an unsaturated carboxylic acid/unsaturated carboxylic acid ester co-polymer; from about 10 to about 75 weight percent of a divalent ion inhibitor and from about 0 to about 10 weight percent of a plasticizer. The polymers are soluble in an aqueous environment having a divalent ion concentration less than about 50 ppm and a monovalent ion concentration of less than about 0.5 weight percent. The polymers are insoluble in an aqueous solution having a concentration of divalent ions greater than about 50 ppm.

Poly(acrylic acid) (from Aldrich, MW 45,000) was incorporated into liquid soap (PCSC C2001-1824) with concentration of 10 weight percent. The mixture can be easily applied onto the hands similar to the original liquid soap, but is very sticky in the hand washing process, and generates sticky fibers between the hands whenever the hands are separated. The mixture is easy to rinse off the hands with water.

PLURONIC® F127 NF block copolymer and liquid soap (PCSC C2001-1824) solution was prepared with PLURONIC® F127 NF concentration of 15 weight percent.

This solution and a 10 weight percent poly(acrylic acid) (from Aldrich, MW 45,000) were applied onto hands from a two-chamber dispenser. The mixture has an obvious viscosity increase and becomes very sticky in the hand washing process, yet is easy to rinse off the hands with water. Using 5 weight percent poly(vinyl alcohol) (from Aldrich, 99 percent hydrolyzed, MW 85,000-146,000) instead of 15 weight percent PLURONIC® F127 NF has the similar effect. It should be noted that the viscosity increases can also be induced by temperature-responsive polymers alone, i.e. by the use of PLURONIC® type block copolymers without the use of polyacrylic acid.

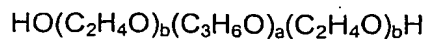
Block copolymers suitable for use in this system include polyols and those of polyethylene glycol/poly(lactic-co-glycolic) acid. Commercially available block copolymers include PLURONIC® and TETRONIC® from BASF. Useful polyoxybutylene based block copolymers conform to the following generic formula:



wherein a and b are integers such that the hydrophobe base represented by $(\text{C}_4\text{H}_8\text{O})_a$ has a molecular weight of at least about 500, preferably, at least about 1000 and most preferably, at least about 3000, as determined by hydroxyl number, the polyoxyethylene chain constituting at least about 60%, preferably, at least about 70% by weight of the copolymer and the copolymer having a total average molecular weight of at least about 5000, preferably, at least about 10,000, and most preferably, at least about 15,000.

The copolymer is characterized in that all the hydrophobic oxybutylene groups are present in chains bonded to an organic radical at the former site of a reactive hydrogen atom thereby constituting a polyoxybutylene base copolymer. The hydrophilic oxyethylene groups are used to cap the polyoxybutylene base polymer.

Polyoxyethylene-polyoxypropylene block copolymers which can be used to form aqueous gels can be represented by the following formula:



wherein a and b are integers such that the hydrophobe base represented by $(\text{C}_3\text{H}_6\text{O})_a$ has a molecular weight of at least about 900, preferably, at least about 2500, most preferably, at

least about 4000 average molecular weight, as determined by hydroxyl number; the polyoxyethylene chain constituting at least about 60%, preferably, at least about 70% by weight of the copolymer and the copolymer having a total average molecular weight of at least about 5000, preferably, at least about 10,000, and most preferably, at least about 15,000.

5 In addition to those polyoxyalkylene block copolymers referred to above, which are suitable in the formation of the compositions of the invention, other polyoxyalkylene polymers which form gels at low concentrations in water are suitable. One such polymer is described in US Patent 4,810,503, incorporated herein by reference. These polymers are prepared by capping conventional polyether polyols with an alpha-olefin epoxide having
10 an average of about 20 to about 45 carbon atoms, or mixtures thereof. Aqueous solutions of these polymers gel in combination with surfactants, which can be ionic or nonionic. The combination of the capped polyether polymers and the surfactants provide aqueous gels at low concentrations of the capped polymer and surfactant, which generally do not exceed 10% by weight total. Detailed methods of preparing these aqueous gels are
15 disclosed in US Patent 4,810,503.

A CELQUAT® H-100 (a cationic cellulose quaternary ammonium derivative from National Starch & Chemicals) and liquid soap (PCSC C2001-1824) solution was prepared with CELQUAT® H-100 concentration of 1.5 weight percent. This solution and a 10 weight percent poly(acrylic acid) (from Aldrich, MW 45,000) were applied onto the hands from a
20 two-chamber dispenser. The mixture has an obvious viscosity increase and becomes very sticky in the hand washing process, yet is easy to rinse off the hands with water.

In still another embodiment, the methods above were combined to produce a soap that changed color and viscosity. The antibacterial liquid soap (PCSC C2001-1824) was again the base material. FD&C green dye number 3 in an amount of 0.1 weight percent
25 and 5 weight percent polyvinyl alcohol were added to the soap to make one component. A second component was made with liquid soap, 0.2 weight percent FD&C yellow dye number 5 (BF Goodrich), 1 weight percent sodium tetraborate decahydrate. A third

component was 2 weight percent citric acid dissolved in water. Upon mixing the components, a green gel is formed. After a time of about 30 seconds, the soap's viscosity was reduced and its color slowly changed to blue.

In still another embodiment, the antibacterial liquid soap (PCSC C2001-1824) was again the base material and the following general preparation was used for all the experiments:

20 ml of the liquid soap was made containing 0.01 weight percent dye. This was physically mixed to ensure uniformity of color throughout the liquid.

20 ml of liquid soap was prepared containing 0.05 weight percent citric acid (Aldrich Chemical Co, Milwaukee, WI) and mixed to ensure it was homogeneously dissolved.

20 ml of liquid soap was prepared containing 0.05 weight percent sodium carbonate (Aldrich Chemical Co., Milwaukee, WI) and mixed to ensure it was dissolved into the soap.

20 ml of liquid soap was prepared containing 0.01 weight percent copper chloride (Aldrich Chemical Co., Milwaukee, WI) was dissolved into the liquid soap.

Approximately 5 ml of the dye containing liquid soap was mixed with an equal volume of liquid soap containing the "activating agent" (e.g. citric acid etc) and the color change noted.

COLOR CHANGE

<u>DYE</u>	<u>FROM</u>	<u>TO</u>	<u>AGENT</u>
Red 28	Colorless	Fluorescent red	Citric acid
Red 27	Pink	Blue	Copper ion

Red 30	Yellow	Red	Sodium Carbonate
--------	--------	-----	------------------

FD&C Dyes (from BF Goodrich, Cincinnati, Ohio)

	Green 3	Green	Blue	Sodium carbonate
5	Yellow 6	Red	Yellow	Citric acid

Food/Beverage Dyes (from Aldrich Chemical Co., Milwaukee, WI)

	New Coccine	Red	Violet	Sodium carbonate
	Litmas	Pink	Purple	Sodium carbonate
10	Carminic acid	Pink	Purple	Sodium carbonate

Other Dyes

	Alizarin complexone	Yellow	Purple	Sodium carbonate
	Neutral Red	Red	Yellow	Sodium carbonate
15	Thymol blue	Yellow	Blue	Sodium carbonate
	Phenolphthalein	Colorless	Magenta	Sodium carbonate
	Chlorophenol red	Yellow	Red	Sodium carbonate
	Bromothymol blue	Yellow	Green	Sodium carbonate
	Nitrazine yellow	Yellow	Purple	Sodium carbonate

20

Thus, a variety of color changing chemistries are available for the liquid soap formulations.

The soap of this invention may be dispensed by any convenient means known to be useful in dispensing two-component systems. Such dispensers are known in the art for dispensing shampoo and the like. These systems may use a squeeze bottle or a single plunger-type pump that displaces an approximately equal volume of each component simultaneously. A disposable form of this method of dispensing includes two

components and a separator in a flexible pouch that may be torn or cut in a manner that allows both components to be released. Examples of such dispensers may be found in US Patent 5,645,822.

As will be appreciated by those skilled in the art, changes and variations to the
5 invention are considered to be within the ability of those skilled in the art. Examples of such changes are contained in the patents identified above, each of which is incorporated herein by reference in its entirety to the extent it is consistent with this specification. Such changes and variations are intended by the inventors to be within the scope of the invention.

CLAIMS:

What is claimed is:

- 5 1) A cleaning aid comprising an indicator that provides an observable change after a period of time after dispensing has passed.
- 2) The cleaning aid of claim 1 wherein said aid is a soap.
- 3) The soap of claim 2 wherein said soap changes in color.
- 10 4) The soap of claim 2 wherein said soap changes in viscosity.
- 5) The soap of claim 2 wherein said soap changes in smell.
- 15 6) The soap of claim 2 wherein said soap changes in sound.
- 7) The soap of claim 2 wherein said soap changes in temperature.
- 8) The soap of claim 2 wherein said soap changes in from a finite time to at most 5
20 minutes.
- 9) The soap of claim 7 wherein said soap changes in between 25 and 35 seconds.
- 10) The soap of claim 2 comprising a first component containing a dye and a second
25 component containing ascorbic acid and iron chloride.
- 11) A soap for cleaning comprising a first component including liquid soap and polyvinyl
30 alcohol, and a second component including borax and citric acid wherein said components are mixed together to produce said soap.
- 12) A soap for cleaning comprising a first component including liquid soap and a second component an ion sensitive polymeric material.
- 13) A soap for cleaning comprising liquid soap and polyacrylic acid.

- 14) A soap for cleaning comprising a first component including liquid soap and a polyoxyalkylene block co-polymer, and a second component including polyacrylic acid, wherein said components are mixed together to produce said soap.
- 5 15) A soap for cleaning comprising a first component including liquid soap and a cationic cellulosic quaternary ammonium derivative, and a second component including polyacrylic acid.
- 10 16) The soap of any of claims 10 through 14 wherein said soap changes viscosity from a gel to a liquid.
- 17) The soap of claim 15 wherein said soap changes viscosity in from a finite time to at most 45 seconds after said components are mixed together.
- 15 18) The soap of claim 16 wherein said soap changes viscosity between 25 and 35 seconds after said components are mixed together.
- 20 19) A soap for cleaning comprising a first component including liquid soap, a dye and polyvinyl alcohol, and a second component including borax, citric acid, ascorbic acid and iron chloride, wherein said components are mixed together to produce said soap.
- 25 20) The soap of claim 18 wherein said soap changes viscosity from a gel to a liquid and simultaneously changes color from green to blue.
- 21) The soap of claim 2 wherein said soap changes viscosity and color in from a finite time to at most 45 seconds after said components are mixed together.
- 30 22) The soap of claim 4 wherein said soap changes viscosity and color between 25 and 35 seconds after said components are mixed together.
- 23) A hygiene teaching aid comprising an indicator that provides a change detectible to a user after a period of time after dispensing has passed.

- 24) A method of developing a hygiene habit comprising the steps of:
dispensing a soap and water into a user's hands,
rubbing the hands together until a change detectible to said user is detected, and
washing the hands with water,
5 wherein said soap contains an indicator that provides said change after a period of
time after dispensing said soap into the hands has passed.
- 25) The soap of claim 24 wherein said soap changes in color.
- 10 26) The soap of claim 24 wherein said soap changes in viscosity.
- 27) The soap of claim 24 wherein said soap changes in smell.
- 28) The soap of claim 24 wherein said soap changes in sound.
15
- 29) The soap of claim 24 wherein said soap changes in temperature.
- 30) The soap of claim 24 wherein said soap changes in from a finite time to at most 5
minutes.
20
- 31) The soap of claim 30 wherein said soap changes in between 25 and 35 seconds.

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
9 October 2003 (09.10.2003)

PCT

(10) International Publication Number
WO 2003/083033 A3

(51) International Patent Classification⁷: **C11D 9/44**,
9/26, A61K 7/50, C11D 17/08

(21) International Application Number:
PCT/US2003/006755

(22) International Filing Date: 5 March 2003 (05.03.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/107,383 27 March 2002 (27.03.2002) US

(71) Applicant: **KIMBERLY-CLARK WORLDWIDE, INC.** [US/US]; 401 N. Lake Street, Neenah, WI 54956 (US).

(72) Inventors: **MACDONALD, John, Gavin**; 1472 Knollwood Terrace, Decatur, GA 30033-1907 (US). **AGARWAL, Naveen**; 2792 Peeler Road, Atlanta, GA 30360 (US). **HUANG, Yanbin**; 507 Belcourt Parkway, Roswell, GA 30076 (US). **KIM, Jaeho**; 480 Elgaen Court, Roswell, GA 30075 (US).

(74) Agents: **ROBINSON, James, B.** et al.; Kimberly-Clark Worldwide, Inc., 401 N. Lake Street, Neenah, WI 54956 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
29 July 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: USE INDICATING SOAP

(57) Abstract: There is provided a soap that contains an indicator that produces an observable change after a period of time to show that sufficient cleaning has been done or to indicate the thoroughness of the cleaning. The soap is preferably made from two components that produce a color and/or viscosity changes after about 30 seconds of use. This use indicating change is useful for, for example, teaching children to wash their hands for a sufficient period of time.



WO 2003/083033 A3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/06755

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C11D9/44 C11D9/26 A61K7/50 C11D17/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C11D A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 805 162 A (CASELLA JEAN CLAUDE) 24 August 2001 (2001-08-24) the whole document	1-3,8,9
X	FR 2 717 184 A (ROTHAN GABRIEL) 15 September 1995 (1995-09-15) claims	1-3
X	EP 0 418 049 A (MAGNAPOWER GROUP LTD) 20 March 1991 (1991-03-20) page 1, line 5 - line 25; claims	1-3,23
X	WO 96/29047 A (WARNER LAMBERT CO) 26 September 1996 (1996-09-26) page 3, line 14 - line 20; claims 1,2,19,22	1,23
	----- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

28 May 2004

Date of mailing of the international search report

09. 06. 2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Grittern, A

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 03/06755

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 669 891 A (GREENWOOD JOHN MALCOLM ET AL) 13 June 1972 (1972-06-13) example 9 column 7, line 22 - line 60; example 9 -----	1,3
X	GB 2 349 646 A (UNILEVER PLC) 8 November 2000 (2000-11-08) claims 1,2,5,23; examples -----	12-14
X	WO 01/19946 A (UNILEVER PLC ; LEVER HINDUSTAN LTD (IN); UNILEVER NV (NL)) 22 March 2001 (2001-03-22) claims -----	12,13,15
X	US 5 891 428 A (GREFF DANIEL) 6 April 1999 (1999-04-06) column 3, line 40 - line 65; claims 1,5 -----	12-14

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/06755

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 5-7, 24-31
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 5-7, 24-31

Claims 5-7 will not be searched because there is insufficient support in ~~the description (Article 6 PCT) or disclosure (Article 5 PCT) for soaps~~ which change in smell, sound or temperature.

Present claims 24-31 relate to a method defined by reference to a desirable characteristic or property, namely a method of developing a hygiene habit by dispensing a soap and water into user's hands, rubbing the hands together until a change detectible to said user is detected, and washing the hands with water, wherein said soap contains an indicator that provides said change after a period of time after dispensing said soap into the hands has passed.

A meaningful search is impossible because the subject-matter of claims 24-31 relates to a result to be achieved, but it is not made clear within the meaning of Article 6 PCT how such a result can be directly and positively verified by tests or other procedures.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-2 (partial), 3, 8-10 (partial), 19, 21 (partial), 23

A cleaning aid comprising an indicator that provides an observable change after a period of time after dispensing ~~has passed, wherein the cleaning aid is a soap that changes in color.~~

A soap comprising a first component containing a dye and a second component containing ascorbic acid and iron chloride

2. claims: 1-2 (partial), 4, 8-10 (partial), 11, 16 (partial), 18 (partial), 21 (partial), 22

A cleaning aid comprising an indicator that provides an observable change after a period of time after dispensing has passed, wherein the cleaning aid is a soap that changes viscosity

A soap comprising comprising a first component including liquid soap and polyvinyl alcohol and a second component including borax and citric acid wherein said components are mixed together to produce said soap

3. claims: 12, 16 (partial), 18 (partial), 20 (partial)

a soap for cleaning comprising a first component including liquid soap and a second component containing an ion sensitive polymer

4. claims: 13-15, 16 (partial), 17, 18 (partial), 20 (partial)

A soap for cleaning comprising liquid soap and polyacrylic acid.

A soap for cleaning comprising a first component including liquid soap and a polymer and a second component including polyacrylic acid, wherein said components are mixed together to produce said soap

A soap for cleaning comprising a first component including liquid soap and a polymer and a second component including polyacrylic acid, wherein said components are mixed together to produce said soap

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US 03/06755

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2805162	A	24-08-2001	FR 2805162 A1	24-08-2001
FR 2717184	A	15-09-1995	FR 2717184 A1	15-09-1995
EP 0418049	A	20-03-1991	GB 2235931 A EP 0418049 A2	20-03-1991 20-03-1991
WO 9629047	A	26-09-1996	AU 4288596 A WO 9629047 A1 ZA 9602276 A	08-10-1996 26-09-1996 30-09-1996
US 3669891	A	13-06-1972	AT 306901 B BE 751207 A1 CH 531560 A DE 2026038 A1 ES 380192 A1 FR 2043849 A5 GB 1317183 A IE 34225 B1 JP 50004204 B LU 61027 A1 NL 7007778 A NO 132282 B SE 385595 B ZA 7003605 A	25-04-1973 30-11-1970 15-12-1972 03-12-1970 16-02-1973 19-02-1971 16-05-1973 05-03-1975 17-02-1975 24-06-1971 02-12-1970 07-07-1975 12-07-1976 26-01-1972
GB 2349646	A	08-11-2000	CN 1279063 A ID 25811 A JP 2001019620 A	10-01-2001 09-11-2000 23-01-2001
WO 0119946	A	22-03-2001	AU 769316 B2 AU 7279400 A BR 0013901 A CA 2384648 A1 WO 0119946 A1 EP 1210402 A1 US 6533873 B1 ZA 200201956 A	22-01-2004 17-04-2001 07-05-2002 22-03-2001 22-03-2001 05-06-2002 18-03-2003 10-03-2003
US 5891428	A	06-04-1999	FR 2737406 A1 AT 201325 T AU 705817 B2 AU 6744396 A CA 2228731 A1 CN 1195284 A DE 69612982 D1 DE 69612982 T2 EP 0841897 A1 ES 2157455 T3 WO 9705856 A1 JP 11510176 T	07-02-1997 15-06-2001 03-06-1999 05-03-1997 20-02-1997 07-10-1998 28-06-2001 13-09-2001 20-05-1998 16-08-2001 20-02-1997 07-09-1999

THIS PAGE BLANK (USPTO)